

REMARKS

Claims 1-18 were in the application. Claims 14-18 have been withdrawn as being directed to a non-elected invention. With entry of this amendment, claims 1, 4 and 5 have been amended. Upon entry of the present amendment, claims 1-13 will be pending and under examination in this application.

The Requirement for Restriction

In the Office Action of January 29, 2009, the Examiner required election of one of the following four inventions:

Group I : claim(s) 1-12, drawn to an electrical storage device;

Group II : claim 13, to an electronic apparatus;

Group III : claim(s) 14-16, drawn to a method of manufacturing an electrical storage device.

Group IV: claim(s) 17-18, drawn to a method of using an electrical storage device.

In the Applicant's response of March 27, 2009, the applicant elected group I with traverse on the basis that all of the claims have the same special technical feature recited in claim 1. The Examiner agreed to rejoin claim 13. However, the Examiner did not find the traverse persuasive with respect to claims 14-18 because claim 1 is directed to a product and these claims are directed to methods of making the product. The Examiner took the position that the product of claim 1 could be made by a different method and a different product could be made by the method. As regards claims 17 and 18, the Examiner found the argument not to be persuasive because he did not find the technical feature to be an inventive concept based on the cited art. As demonstrated by the remarks below, this is not the case. Consequently the Applicant requests that the Examiner reconsider joining claims 17 and 18.

In addition to the election of invention the Examiner in the prior office action also required an election of species. In response the Applicant stated:

For the purpose of further prosecution, the applicant elects the lithium electrode arranged to be out of direct contact with the negative electrode, and the lithium ion being supplied to the negative electrode by flowing a current between the lithium electrode and the negative electrode through an external circuit as recited in the Abstract.

The Examiner in the present office action questions the phrase "as recited in the Abstract," stating that it "is unclear and only pertinent with respect to the claimed invention." Office Action Page 3. Clarification was required. The phrase was only intended to indicate that the selected species is recited in the Abstract.

The Abstract

In the Office Action the Examiner objected to the Abstract because it has more than 150 words. Correction was required. A new Abstract, which complies with the requirement, is presented with this response.

The Arrangement of the Specification

The Examiner noted that the specification was not in the format recommended by rule 37 CFR 1.77(b) in that the Brief Description of the Drawings did not precede the Disclosure of the Invention. Actually the section entitled "DISCLOSURE OF THE INVENTION" should be entitled "SUMMARY OF THE INVENTION" according to the rule. The BRIEF DESCRIPTION OF THE DRAWINGS at paragraphs [0133] – [0151] of the published application should be moved to just after paragraph [0059]. A title should be inserted before paragraph [0060] stating "DETAILED DESCRIPTION OF THE INVENTION." By the present amendment, these changes have been made.

Claim Rejections Under 35 U.S.C. § 103

Claims 1, 2, 4, 6-10, 12 and 13 were rejected under 35 U.S.C. § 103 as being obvious and unpatentable over U.S. Patent No. 6, 862,168 of Ando (Ando '168) in view of U.S. Patent No. 6,025,093 of Herr (Herr). Claims 3 and 11 were rejected on the same

ground based on the Ando '168 and Herr patents, further in view of U.S. Patent No. 6,461,769 of Ando (Ando '769). Claim 5 was rejected under Ando '168 in view of Herr and further in view of U.S. Patent No. 6,653,018 of Takahashi (Takahashi) or U.S. Patent No. 6,576,365 of Meitav (Meitav).

The problem with the prior art indicated in the background section of the application is that when electrolyte is provided to a lithium ion secondary battery where there is electrochemical contact between the lithium metal and the negative electrode, the lithium ions immediately begin to flow. This creates non-uniform current and it is impossible to check the amount of lithium ion that is carried. Par. [0011]. Further, it causes the negative electrode to harden in a rippled shape. Par. [0012]. Also, the temperature rises before the cell is fully sealed. Par. [0014].

According to the present invention as defined by claim 1, these problems are avoided by eliminating the direct electrochemical contact between the lithium metal and the negative (or positive) electrode that would result in activation of the battery. Instead, as recited in the amended claims, terminals are provided outside of the device container which are connected to the positive, negative and lithium electrodes inside the container. Then the lithium ions are supplied to the activating electrode (negative or positive) "by flowing current between the lithium electrode and the [activating] electrode through an external circuit which connects the lithium electrode terminal with the [activating] electrode terminal outside the container."

As noted by the Examiner, the primary reference, i.e., Ando '168, "does not teach ... the lithium electrode being arranged to be out of direct contact with the negative electrode" (claim 1). Instead, the Examiner relies on Herr for this disclosure. In particular, the Examiner states that Herr teaches "a lithium ion cell wherein an auxiliary source of lithium is provided in the cell but is kept out of direct contact with the positive and negative electrodes." However, in Herr the lithium cell does not have a "lithium electrode terminal [including] portions located outside the container of the electrical storage device." As an example, Herr discloses "a lithium disk ... inserted in the base of the cell container. The lithium disk is short-circuited to the negative electrode via the cell container." Col. 5, lines 16-22. As a result, it is not possible with the Herr construction to

have "lithium ions ... supplied to the negative electrode and/or the positive electrode by flowing current between the lithium electrode and the negative electrode and/or the positive electrode through an external circuit which connects the lithium electrode terminal with the negative electrode terminal and/or the positive electrode terminal outside the container." In effect, there is no part of the lithium electrode which extends outside the device so it can be connected to an external circuit.

In rejecting claims 3 and 11 the Examiner relies on the Ando '168 and Herr references, as well as the Ando '769 reference. In particular, the Examiner relies on the Ando '769 reference to show configuring the current collectors to have pores therein as recited in claim 3, and the electrode active material as a thermally-processed material of an aromatic condensed polymer, and an insoluble and infusible base having a polyacene-based skeletal structure with a hydrogen/carbon atomic ratio of 0.50 to 0.05, as recited in claim 11. However, claims 3 and 11 depend from claim 1, and the Ando '769 reference fails to disclose a lithium electrode out of direct contact with the positive or negative electrode and having a terminal extending outside the device so it can be connected to the positive or negative terminal by an external circuit. Thus, claims 3 and 11 are patentable because they depend on claim 1.

In rejecting claim 5 the Examiner relies on the Ando '168 and Herr references further in view of either the Takahashi or Meitav references, which are cited to disclose the housing being a laminate structure. Again, none of these references disclose a lithium electrode out of direct contact with the positive or negative electrode and having a terminal extending outside the device so it can be connected to the positive or negative terminal by an external circuit. Thus, claim 5 is also patentable because it depends on claim 1.

CONCLUSION

In view of the above amendments and remarks, it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining, which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

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Respectfully submitted,

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